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The Forester

SPRUCE FOREST IN THE ADIRONDACKS.

A monthly magazine, devoted to the care and use of forests and forest trees and related subjects

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THE AMERICAN FORESTRY ASSOCIATION.

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The object of this Association is to promote:

1. A more rational and conservative treatment of the forest resources of this continent.
2. The advancement of educational, legislative and other measures tending to promote this object.
3. The diffusion of knowledge regarding the conservation, management and renewal of forests, the methods of reforestation of waste lands, the proper utilization of forest products, the planting of trees for ornament, and cognate subjects of arboriculture.

Owners of timber and woodlands are particularly invited to join the Association, as well as are all persons who are in sympathy with the objects herein set forth.

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A Correction.

In A. K. Mlodziansky's article on the "Acre Yield of White Pine in Pennsylvania," in the July number, in the 9th line, first column, page 145, the figure "47" refers to the two acres measured, and is twice the number of pine per acre. The sentence should read: "23 in number."

The Omaha Forestry Meeting will be held on the 7th and 8th of September, Mr. F. W. Taylor telegraphs us just as we go to press.

Note change in the meetings of the American Forestry Association.

Plea for the Forests of Maine.

Beautiful trees of the primitive forests,
Oft in your shades I'm delightfully led,
Culling the wild flowers, resting in green bowers,
Where to my feet a rich carpet is spread.

Music of warblers free everywhere greets me,
Blending in harmony's unwritten song;
Lo, from the depths profound, chanting a merry round,
Onward the ocean-bound brook glides along.

Wonderful trees with your branches extending,
Casting your shadows and shedding your dew,
Moved by the breezes, dependently bending,
Gratefully clouds pass their shadows o'er you.

Mighty in strength, wealth and pride of the nation,
Waving in grandeur o'er mountain and plain,
If ye could speak, 'twould be: "Check the strong ax-man,
Save and protect us, ye powers of Maine."

Thus the great Pine-Tree State may, by an effort,
Rescue the forests by which she is blest;
Finding in recompense, treasures of excellence,
Richer by far than the mines of the West.

Beautiful trees of the primitive forest,
O, how delightful to walk in your shade,
Culling the wild flowers, resting in green bowers,
Where underfoot a rich carpet is laid!

AURELIA G. MACE.

Sabbathday Lake,
New Gloucester, Maine.

We desire to commend unreservedly the leaf charts prepared by Miss Graceanna Lewis which are advertised elsewhere in these columns. They will be found invaluable in teaching the young, and Miss Lewis has done a great service in preparing them for the educational field.

Stephen A. Appleton, Secretary of the Media Public School Board, and Editor of the "Delaware County American," says truly:

"Miss Graceanna Lewis, of Media, has devoted many years to the study of trees and

shrubs, and is perhaps the best informed woman upon this subject in the State. Her water-color paintings at the World's Fair attracted a great deal of attention, and receive high commendation from forestry experts. In order that others may be benefited by the knowledge she has acquired, she is now at work upon a series of uncolored charts, giving full-sized illustrations of the leaves of trees that grow in this climate. No. 1 has already been printed by the Levytype Company, of Philadelphia, and No. 2 will speedily follow. We have seen the drawings for the latter, which are even more beautiful than the first. These Charts must prove exceedingly useful in all schools, whether public or private. The Media School Board has ordered them for the Public Schools here."

Forestry in Canada.

Anything relating to forestry, and more especially anything that devises a lanp for the reclamation of the vast tracts of denuded lands all over the country, cannot fail to excite interest in all thinking people; therefore the preliminary report of the Royal Commission on Forestry appointed by the Ontario government in June, 1897, and which is just published as an appendix to the annual report of the Clerk of Forestry, will be read with interest by people both in the United States and Canada. The commission was appointed to submit a scheme for the reclamation of large areas of non-agricultural land, at present unproductive, along with such suggestions for the carrying on of future lumbering operations as the information obtained would show to be desirable for the prevention of other wooded land becoming waste. It was thought advisable that the commission should visit as large an area as possible, and so certain townships in Peterborough County, the region along the north shore of Lake Nipissing and down the Vermillion River, the country around Thessdon and Alguna Mills, and other points north of Georgian Bay and in the neighborhood of Sault Ste. Marie, portions of territory north of Lake Superior, along the Port Arthur & Duluth Railroad, the Rainy River region, and parts of Minnesota and Michigan were visited.

The conclusions reached from these investigations were that, with sufficient areas set aside for the purpose, and resonable care and protection of the young timber now growing on them, there might be a very considerable augmentation of the merchantable timber in Ontario. In most of the places visited the growth was at all stages, and when the original growth had been Pine or Pine mixed with other trees, the tendency was toward a reproduction of the same species. Sometimes the faculty of reproduction had been denied free play. The forest wealth of Ontario once seemed so limitless that the thought of future timber famine never entered the heads of the improvident settlers, and the lumbermen were led to adopt careless and improvident methods. Incautious and wasteful practices caused widespread damage. Tops and branches of trees were left littered on the ground to feed the destructive fires which until recently no effort was made to check.

The theory once widely prevalent that when White Pine was cut away it was succeeded by inferior varieties has been proved by examination to be baseless. In most of the territory burned over Pine was found mixed with other trees, but over these it gradually asserted its supremacy. The exclusion of fire and the adoption of more intelligent methods of lumbering would, it is believed, secure the reproduction with least possible delay of the varieties desired. Where the ravages of fire have had full sway the seeds have sometimes perished. Though Pine seeds are winged, they do not in falling scatter to a great distance from the parent trees, and when the latter are few, the process of re-afforestation is slow. How far the seeds of White Pine may be carried from the parent tree is a question still unsettled Meanwhile, the Aspens, Birches and Cottonwoods send their downy seeds long distances by means of the wind, and the burned-over area is soon covered by a vigorous crop of these varieties.

The report selects as a typical instance of the course of events, in a settlement where farming and lumbering

operations are combined, the township of Burleigh, in Peterborough County. The original forest within this area of 124 square miles was mainly Pine of excellent quality, mixed with hard woods; but the usual devastation from forest fires ensued, and the whole country was ravaged. West of Eel's Creek, around Burleigh Post-office, the country is a veritable wilderness, having been repeatedly burned over, the latest occasion being in 1896. East of the creek the country has a different aspect, the young forest consisting largely of White and Red Pine, Poplar, White Birch, Balsam, and Spruce, Black Ash, Cedar, and here and there odd relics of the original Pine forest. On inquiry the commissioners learned that it was twenty-three years since the last fire occurred. It was concluded that within thirty-five years lumbering operations could be resumed with profit, by the removal of the large merchantable Pine, thus giving the younger trees a chance to grow. The one essential for the maintenance of a continuous supply was the absolute prevention of fire.

The loss by fire can only be accurately estimated by calculating the amount of the probable "consequential damages." The destruction of year-old seedlings might be, in actual loss, immaterial; but in forty or fifty years, if preserved, those same seedlings would represent a forest wealth of hundreds of millions. In this way Dr. Rothrock computed that if the uncared-for lands in Pennsylvania were protected from fire, they would in 1938 be worth $1,200,000,000. In the north country, along the Missinabie, flowing into Hudson's Bay, the commissioners found the results of carelessness on the part of the Indians, large tracts having been again and again burned over. The cutting of small trees also did much damage, and squatting was not to be encouraged. It was of the utmost importance to protect the young growing trees against their enemies. The commissioners recommended an extension of the system of fire ranging, and the putting of the system under the control of the Crown Land Department; the invitation of the Hudson's Bay Company officials to co-operate with the government in apprising the Indians (by proclamations in their own languages) of the regulations; the holding by the Crown as forest reserves of unworked limits of which rent is two years in default; the prohibition (save under special conditions) to license-holders to cut trees for logs less than twelve inches across the stump two feet from the ground, and the withdrawal from sale or location, to be kept as permanent Crown forest reserves, of areas of territory not suitable for settlement, but valuable for timber-growing.—*N. Y. Evening Post.*

Acre-Yield of White Pine in the Lake Region.

White Pine in the Lake Region rarely occurs in pure growth. It is usually found mixed with other species, chiefly hardwoods, Norway Pine, Hemlock and Fir. On sandy soils the White Pine commonly occurs in mixture with Norway Pine, with only a limited number of Hemlock, Fir, Cedar (*T. occidentalis*), Spruce and a few scattered Maple, Beech and Birch. The proportion in which White and Norway Pine are mixed varies not only in the same locality but even on the same ground. Frequently an acre may be found on one-half of which the White Pine predominates, while on the other half the Norway is the more abundant. On cooler grounds the pines give way to Hemlock, among which the White Pine occur as large isolated individuals. Swamps are stocked with Spruce and Cedar (*T. occidentalis*), with White Pine, either intermixed or scattered. On ridgeland the open grassy swamps are covered with Alder and Hackmatack fringed by the White Pine. On loamy sand or sandy loam the admixture of hardwoods becomes more noticeable; they appear either in a small number of comparatively well-developed individuals or in a large number of small trees

scattered all over the ground, thus forming, together with young Hemlock and Fir, the undergrowth in the pineries.

On clayey loam mixed with sand hardwoods are almost evenly mixed with the White Pine. On clayey soils the hardwoods, especially Maple, Beech and Oak, form the bulk of the forest, in which White Pine occurs either occasionally or scattered, or in admixture in a comparatively small proportion.

Such are the various mixtures in which the White Pine is found within the range of the Lake Region. It may be added that under all conditions considerable variation occurs owing to the differences in the ages of the individuals constituting the virgin forest, to the difference in the density of crown cover and to the distribution and situation of the Pine.

This brief outline of various conditions under which the White Pine is found makes it clear that in establishing the yield per acre the various typical forms of Pine growth must be separately considered. The data given for the following typical sites are based upon the measurements taken by the Division of Forestry in the various localities of the Lake Region.

(1) White Pine with occasional Norway Pine, with a scanty undergrowth of young Oak, Hemlock and Fir:

Soil—Brown sandy loam, deep and fresh. 396 White Pine to the acre, from 6 to 17 inches in diameter (breast high) and from 65 to 75 feet in height. Age, 50 to 60 years. Density of crown-cover 0.8. Total volume of boles per acre, 7,202 cubic feet.

(2) White Pine with scattering Hemlock, occasional Spruce and Fir, with a scanty undergrowth of hardwoods, Hazel and young Hemlock. Soil, gray or brown loamy sand, deep, fresh, with 3 inches of mold on top. 328 White Pine to the acre, from 6 to 17 inches in diameter (b. h.), and 45 to 75 feet in height; 160 young White Pine, 20 mature and 20 young Hemlock. Age, 50 to 60 years. Density of crown-cover, 0.7; total volume of boles of White Pine per acre, 4,070 cubic feet.

(3) White Pine with scattering Red and White Oak and occasionally Norway Pine, with a moderately dense undergrowth of hardwood and Hemlock. Soil, gray or brown loamy sand, deep, fresh, with 3 inches of mold on top. 118 White Pine to the acre, from 11 to 26 inches in diameter and 75 to 95 feet in height. Age, 90 to 100 years; density of crown-cover, 0.5; total volume of boles of White Pine per acre, 7,383 cubic feet, which under present lumber practice produces 29,400 feet B. M.

(4) White Pine intermixed with Norway Pine and occasional Spruce, with a scanty undergrowth of Fir, Spruce and few Hemlock. Soil, sand, brown in color, deep and fresh. 314 White Pine to the acre, from 7 to 15 inches in diameter and 65 to 75 feet in height; 86 young White Pine, 52 Norway Pine, 2 Spruce and 2 Fir. Density of crown-cover, 0.8. Age, 50 to 60 years. Total volume of boles of White Pine per acre, 4,800 cubic feet.

(5) White Pine mixed with Norway Pine, Hemlock, with scattering Cedar (*T. occidentalis*) and occasional hardwoods. The undergrowth consists of young Fir. Soil, gray sand, light, loose and fresh. 130 White and 26 Norway Pine to the acre, from 15 to 26 inches in diameter and 110 to 120 feet in height. Density of crown-cover, 0.8. Age, 130 to 140 years. Total volume of boles of both White and Norway Pine per acre, 11,700 cubic feet, which gives 56,000 feet B. M.

(6) Norway Pine mixed with White Pine and occasional hardwood. Soil, sand, gray or yellow in color, moderately loose and fresh. 67 White and 115 Norway Pine to the acre; from 15 to 22 inches in diameter and 90 to 120 feet in height. Density of crown-cover, 0.6. Age, 120 to 140 years. Total volume of boles of both White and Norway Pine per acre, 8,400 cubic feet, which gives 40,000 feet B. M.

(7) White Pine mixed with hard-

woods (Maple, Yellow Birch, Elm, Basswood, Oak and some others), with scattering Hemlock and Fir, on ridgeland. Soil, clayey loam mixed with sand. 108 White Pine to the acre; from 12 to 33 inches in diameter and 75 to 130 feet in height; 50 Maple, 4 Yellow Birch, 4 Bass, 4 Elm, 6 Hemlock, 4 Fir and 2 Norway Pine. Age, 150 to 210 years. Total volume of boles of White Pine to the acre, 13,628 cubic feet, which gives 64,000 feet B. M.

(8) Hardwoods mixed with White Pine intermixed with Fir and Hemlock; undergrowth consists of young hardwoods and Fir. Soil, loamy sand, moderately loose and fresh. 48 White Pine to the acre, from 24 to 40 inches in diameter and 120 to 150 feet in height. Age, 230 to 260 years. Total volume of boles of White Pine per acre, 12,000 cubic feet, which gives 51,000 feet B. M.

(9) Hardwoods intermixed with White Pine; undergrowth consists of young hardwoods. Soil, clay, light in color and fresh. 50 White Pine to the acre; from 18 to 36 inches in diameter and 100 to 120 feet in height. Age, 150 to 210 years. Total volume of boles of White Pine per acre, 11,100 cubic feet, which gives 53,300 feet B. M.

(10) Hardwoods intermixed with White Pine; undergrowth consists of young hardwoods. Soil, fresh clay, with mold on top. 46 White Pine to the acre; from 14 to 38 inches in diameter and 120 to 130 feet in height. Age, 150 to 210 years. Total volume of boles of White Pine per acre, 8,200 cubic feet, which gives 39,300 feet B. M.

(11) All conditions same as in (10), with 60 White Pine per acre, 16,200 cubic feet, which gives 77,700 feet B. M.

(12) Hardwoods with scattering White Pine; undergrowth consists of hardwoods. Soil, clay, light in color and fresh; 19 White Pine to the acre; from 18 to 36 inches in diameter and 100 to 120 feet in height. Age, 150 to 210 years. Total volume of boles of White Pine per acre, 4,755 cubic feet, which gives 23,000 feet B. M.

A. K. Mlodziansky.

Extracts from Foreign Forestry Periodicals.

Made by C. A. Schenck, Ph. D.

Zeitschrift fur Forst und Zagdwesen.

Ever since forestry management was established the question has given rise to turbulent scenes in German legislative bodies, whether and to what extent the removal of litter from the ground floor affects the forest overhead.

As rights of user (easements) held by the farming population, the object of which is forest-litter, are frequent in Germany and Austria, the question was and is an important one.

In almost all states composing the German Empire, sample plots have been kept for a series of years, from which the litter is removed periodically, whilst it is left on adjoining plots of otherwise identical description.

In Rhenish Prussia a series of practical tests was started as early as 1873. It is now stated by Prof. E. Ramann, Eberswalde, that the increment of trees standing on areas frequently denuded of litter is decidedly and badly interfered with; that the trees (Beech) are getting stag-headed; that the soil is getting hardened. Prof. Ramann apparently expected to find the chemical contents or plant food supplying substances of the soil lessened, too. Of course, as the vegetable mold contains nitrogen, the mineral soil lacking a vegetable cover might be expected to contain less nitrogen than it would when underlying a thick carpet of rotting leaves. However, chemical analysis was unable to discover marked differences, occurring in a regular way, on the sample plots. On the other hand, the physical condition of forest soil is decidedly affected by the removal of litter, its porosity being lessened so as to render the soil more compact.

The results of the German investigations with reference to the role performed by the forest litter are of utmost importance to us, as in our forests the vege-

table mold or litter is almost everywhere removed as closely as possible by forest fires.

□ Forstmeister Baden has gathered seeds from *Pinus rigida* and *divaricota*, from trees grown in Prussia, harvesting 0.35 pounds of winged seeds from one bushel of cones. *Pinus rigida* is strongly recommended for afforestation of the poorest classes of land, of sand dunes and of shifting sand. *Pinus divaricota* so far has given the very best satisfaction, being even less exacting than *Pinus rigida* and growing almost twice as quick in early growth as *Pinus sylvestris*.

The following table gives the yield (timber and money) of some state forests in Germany during 1895, per acre, after official documents used by the *Zeitschrift fur Forst und Zagdwesen:*

	Yield per acre, cubic feet.	Net yield per acre.	Average value of timber and wood per cubic foot.
			Cts.
Grand Duchy of Sachsen-Coburg	57.27	$1.52	6.0
Kingdom of Wurtemberg.	81.73	2.35	9.2
Duchy of Anhalt	52.44	1.13	5.9

Le Bois.

Those who do not believe that raising trees is quite a paying business ought to look up the price lists published about bi-weekly by *Le Bois* giving the value of timber and logs in Paris, France.

For instance, there is quoted in the number of January 15, 1898: Oak logs, 14 inches through, 270 francs per 1,000 feet, B. M., Doyle. Oak logs, 18 inches through, 240 francs per 1,000 feet, B. M., Doyle. Oak logs, 20 inches through, 285 francs per 1,000 feet, B. M., Doyle.

There cannot be any doubt that the constant increase of population and the constant decrease of virgin supplies will, in the course of the next century, bring the American price-level pretty close to the present European one. Hurrah, then, for those Americans who understand the signs of the time, planting or rather preserving trees early enough.

To illustrate the American log-export to French ports, we take the following statements from *Le Bois* giving number of American shipments received at Le Havre during January, 1898:

163 Poplar logs, 44 Cedar logs, 56 Walnut logs, 584 Persimmon logs, 6,069 Elm (pieces) sawn timber, 4,397 Oak (pieces) sawn timber, 2,555 miscellaneous sawn timber, 10,724 North Carolina Pine (pieces), 82,500 Oak staves, 510 paper pulp (colis).

Revue des Eaux et Forets.

It is a strange fact that the damage done to forest trees by insects has increased abroad considerably since the establishment of forestry as a business. As long as nature is left alone, all wounds inflicted are healed by nature, for if that was not the case, at least with the species now existing, this one or that one would be known as an antediluvian occurrence only.

M. Julien Colas reports at length what damage was done by and what measures were adopted against the ravages of *Cnethocampa pityocampa*, the processian caterpillar, in Southern France, a contribution probably more interesting to the American entomologist than to the American forester.

M. Ch. Broillard makes some pleasant remarks upon the standards kept in coppice woods. Almost all broad-leaved woods in this country resemble "coppice under standard" forests—the fires having done all the coppicing required since scores of years. In the broad-leaved forests of the Old World, coppice and coppice standards took the place of the virgin growth very frequently. Many of such woods are now gradually given back to the system of high forest.

President Faure has issued a new general regulation on fishing in creeks and rivers, with reference to methods, seasons, species, etc.

Indian Forester.

It is a fact more than astonishing that forestry in the United States by the majority of her citizens is still considered to be the object of a fantastic wish, whilst it is making practical progress in the far East. The November, 1897, number of the *Indian Forester* reports the following restrictions as being practically adopted by the government of Siam with reference to Teak forests owned by it:

1. Teak trees less than twenty-five inches through at the base must not be cut.

2. The entire forest is to be divided into sections, each to be worked over at fixed intervals of time, with a view of providing for a sustained annual yield. Permits are given by the government for the areas to be worked, whilst the permit holders seem to have the logs cut, dragged (by elephants) and floated under a lease system established and controlled by the government. All leases are for the term of six years. Each log is branded with a mark peculiar to the permit holder. No Teak tree is to be cut unless there is another Teak tree in the vicinity able to cast its seeds on the ground covered by the tree to be felled. A fine is to be paid for each tree badly damaged in felling. The minister of the interior has the right of closing part of the area worked for sylvicultural purposes.

The government receives a royalty from each log floated, to be collected from "Menam"—floated timber at Chainat—and from "Salween"—floated timber at Moulmain.

Mr. T. P. Copeland gives a short sketch of the method of propagating *Ficus elastica* (the rubber tree), adopted by him for the forests of Assam, controlled by the British government. For more than twenty years her Majesty's Indian Forest Service has been busily engaged in securing a sufficient regeneration of rubber trees, the virgin supplies having become rapidly exhausted.

Several opinions have been heard lately in the *Indian Forester* relative to "Gournoud's Method of Forest Management," which has been advertised as enthusiastically as the divine Sarah Bernhardt. Gournoud's "Methode du Controle" prevents overcutting. That is one decidedly good, but not at all new, idea of it—by frequent stock taking. The father of the "new" method is opposed to absolutely even aged forests, as a matter of principle, which conviction he shares with the majority of intelligent foresters. No doubt the method is all right under the circumstances prevailing in the section of France to which Gournoud first applied it. However, a system suitable for one locality is not suitable for all, and it is preposterous to claim a certain system of forestry to be a "jack of all trades," the much more if it neglects financial considerations of the first order, viz: the value of the growing stock and the annual revenue derived from it.

Woodland Pasture and Cattle Value.

Woodland pasturage has been constantly practiced in North Carolina since the days of the early settlers, and the same is true of ranging swine, and there was every reason why it should have been practiced for a great many years. So long as the range, as the wild lands used for pasturage are called, was so extensive as to afford the most ample room and forage for all cattle; and while the value of any other natural produce was less than the value of the pasturage; and while the quality and value of the cattle were a matter of small concern so long as they secured a cheap living, and one giving the owner no greater trouble than looking them up at intervals—so long as these conditions prevailed, unrestricted woodland pasturage was both the natural and most profitable utilization of the land. When they ceased to exist, when the value of the timber that could be grown on the land each year exceeded the value of the cattle and their products, it became desirable, if the land is to be utilized most profitably, to restrict pasturage and

permit the timber to grow, the conditions being such that both can not be carried on simultaneously. And on account of the appreciation in the value of the timber crop, the conditions of one hundred or even twenty-five years ago have so thoroughly, though gradually changed, that nowhere in this State, on areas of considerable size, is the profit derived from cattle reared on woodland pasturage sufficient to compensate for the damage done to timber and the reproductive power of the woodland.

The damage due to pasturage may be divided into the direct damage inflicted directly by the cattle and swine; and the induced or consequent damage, which is far greater than the direct damage, caused by fires which are often begun to improve pasturage, or to clear out the underwood and open up the woods for pasturage.

The direct damage done by excessive pasturage is much greater to deciduous-leaved trees, like Oaks (hardwoods) than to pines, which, on account of the resinous principle in their foliage, are usually neglected by browsing cattle. The damage done to woodland formed of deciduous or broad-leaved trees consists, for the most part, in suppressing a considerable portion of the young growth; or, where the pasturage is excessive, in preventing any young growth from maturing, or only such kinds as are neglected on account of offensive properties. This gives the neglected species a great advantage, and its abundance relative to that of the other kinds is greatly increased. As the old growth gets thin there are few or no young trees to take its place, and what there is, not being forced up to secure the light by the struggle of the trees in a dense young growth, is shortbodied, with much of the trunk covered with limbs, lessening the timber value and the amount of timber produced per acre.

The damage done to pine woodland by browsing cattle is slight, though in some of the mountain countries sheep suppress young White Pines by trampling on them and occasionally biting off the young seedlings. But considerable damage is to be attributed to swine in preventing the reproduction of the Longleaf Pine. This Pine produces seed in abundance only at intervals of several years, 5 to 7, and when a seed year occurs hogs devour the mast in great quantities. The seed is the shape and about half the size of an almond kernel. After the seed germinates and roots the hog continues for 3 or 5 years to dig up these Pine seedlings and eat the roots, often digging the lower part up from a depth of 12 or more inches in the sand. Many millions of seedlings are thus yearly destroyed so long as any are to be found. The mostly single, large root is carrot shaped, rather succulent, scarcely resinous and somewhat saccharine in taste, at least during some seasons of the year. While the suppression of this Pine can not by any means be entirely due to the hog, that animal has something to do with it.

Fires are purposely set in many places where woodland pasturage is relied on with the object of improving the range by removing dead herbage, and killing saplings and bushes, which by sprouting from the shoots will form tender young shoots.

The burning of woodland to improve pasturage is most common in the Longleaf Pine lands in the southeastern portion of the State, and along the Blue Ridge and its eastern spurs in the western part of the State, where the woods are largely formed of broad-leaved deciduous trees.

The depredations of the hog and damage by fires, many of them started to improve pasturage, have so thoroughly caused the suppression of all young growth of Longleaf Pine for a period of over one hundred years, that now few trees of younger age than one hundred years can be found. This has caused, since no other valuable tree grows on this sandy land, nearly two million acres of land, eminently suitable for the growth of the Longleaf Pine, to be now lying

waste; and besides an annual loss to these southeastern counties exceeding $500,000 is incurred by this single item.

Neglecting in this connection the broad-leaved woodland of the mountains, I will show the relative profits derived from the pasturage of this Longleaf Pine land as it is now practiced, and what the profits derived from it would be if it were in timber. The figures from which the following results are obtained are taken from the last annual report of the Auditor of State (1895 assessment), except the area of woodland, which is taken from the last census returns and within which has been included all lands except meadow and tilled lands.

The average value of cattle and hogs for each acre of woodland in the southeastern (Long-Leaf Pine) counties is slightly over fifteen cents.

To show just what this means I will distribute the data relative to Brunswick County. Only one-tenth of this county is under tillage. The average value of a cow is $5.60, and each head of cattle has 56 acres of timber land on which to graze; and this cow interest of 10 cents per acre is so paramount that it has largely been the cause of preventing a regrowth of pine on 150,000 acres of woodland in this county.

The 15 cents given above as the average value per acre of woodland of the cattle also includes the swine. The gross yearly revenue from this can not amount to more than 8 cents per acre, which is 2 cents more than the value of the production of the cattle and swine in these counties each year, as given in the last census report.

The yield of timber from this land, or at least from most of it, upon an area amounting to two million acres is now extremely small, amounting to not over one cent per acre. The real net income possible from the land if in timber, allowing the timber to grow at the rate of four thousand feet of board per acre in fifty years, which is a ridiculously low figure, would be, for the stumpage alone, $1 per thousand feet; or 8 cents net per acre annually. Taxes of course in either case are assumed to be the same. This does not include the turpentine privileges, which, at present prices, for a four-year virgin lease, would amount to as much more as the value of the timber, making a net income of 16 cents per acre. If the gross value of the timber and turpentine to the community be compared with the gross value of the cattle to the community, the difference in value in favor of the timber will be very great, as the cost of manufacturing the timber and the production of resin and turpentine from the trees will bring the gross revenue per acre up to 80 or 90 cents per year, calculating on the basis of the present low prices.

But if continuous woodland pasturage is destructive to the forest, it is equally as detrimental to the improvement of stock in breed, and in preventing the general development of first-class individual specimens even in the most common breeds. To show how detrimental woodland pasturage has been in preventing the improvement of the common breed of cattle which was originally owned in all parts of the State, I will compare the value of the cattle per head in those counties where woodland pasturage is nearly exclusively practiced, with the value of the cattle per head in the few counties in this State where meadow pasturage is most largely practiced. It must be borne in mind that in the selection of these counties I have taken those in which there are no improved herds, and where no cattle are held at fancy prices for breeding purposes or as great milk-givers.

I will select three of the mountain counties with which I am well acquainted and where I know that only a small portion of the stock, even in summer, is left for free woodland pasturage, and where I know that the stock is properly cared for in winter.

The counties I have selected where meadow pasturage is practiced are Ashe, Alleghany and Watauga. These counties form a group in the extreme northwestern portion of the State and lie at a greater distance from transportation

facilities than any other counties in this State. In Ashe County the value of a head of cattle is $9; in Watauga, $9 60; in Alleghany, $8.80. This gives an average value of $9.20 for the grassland fed cow from these three adjoining counties.

A comparison of the value of the grass-fed cow of the Ashe County group with that of a cow from any county of the pineland group at once shows the unsatisfactory prices which cows reared on woodland pasturage can be expected to bring. The average value is $5.75 for the woodland pastured beef of the southeastern portion of the State, against $9.20 for the grass-fed cow of Ashe or Alleghany counties.

Besides, it takes from three and one-half to ten times as many acres of woodland to pasture a cow as it requires of carefully kept grass land, so that the real value of the land required to keep a cow is about the same, whether it is cheap, neglected woodland or valuable, well-cared-for grass lands

I believe the native breed of hog has suffered just as much degeneration as the native cow in those portions of the State, and in fact throughout those portions of the Southern States where woodland pasturage and free range have been the rule, though I have not had time to look this matter up.

The first step toward a general improvement of the stock in the State must be to secure their protection and to have better care bestowed upon them. This can only be done by abolishing woodland pasturage, bringing the cattle on smaller area of grassland, where they can be easily found and cared for, and where the utilization of milk can be made possible. The chief step in this direction, I believe, would be to secure the passage of "No Fence Laws," and to show those who are interested in the improvement of stock that improvement can only accompany extra care and protection.

The North Carolina Forestry Society is greatly interested in the cessation of woodland pasturage, as many of the destructive forest fires are evidently traceable to the burning of the woods for pasturage. It is safe to say that the loss to this State from forest fires yearly amounts in the gross to a million dollars.

W. W. ASHE.

The Forests of Cuba.

Cuba still possesses 16,000,000 acres of valuable timber, none of which is useful as coarse construction lumber, while nearly every foot would be salable in the United States and bring high prices. Cuban Mahogany and Cedar are particularly well known in the United States. The Mahogany is very hard and shows a handsome grain, and is preferred by many to any other variety in common use. The moment Spain drops the reins of government in Cuba there will be a movement of forest products which will have a beneficial effect upon the industry of both countries.

First to feel the force of this movement toward rehabilitating Cuba will be the lumbering interests of the South Atlantic and Gulf coasts. Prior to three years ago they looked upon Cuba as an excellent outlet for the coarse end of the mill cuts, and since that market has been closed, the coarser grades of Yellow Pine produced at coast points have been marketed with great difficulty and seldom at a profit. It is unfortunately true that Cuba will be unable to realize so promptly from a movement to re-establish her Mahogany and Cedar trade, for it is claimed by prominent operators that the industry has been so completely crippled by the ravages of war that a period of time running from twelve to eighteen months will be required before logs can be landed at ports in this country. Prior to the war the annual net revenue of Cuba was $80,000,000. With peace restored under a conservative form of government, she would gain strength and prestige from her closer relations with the United States.

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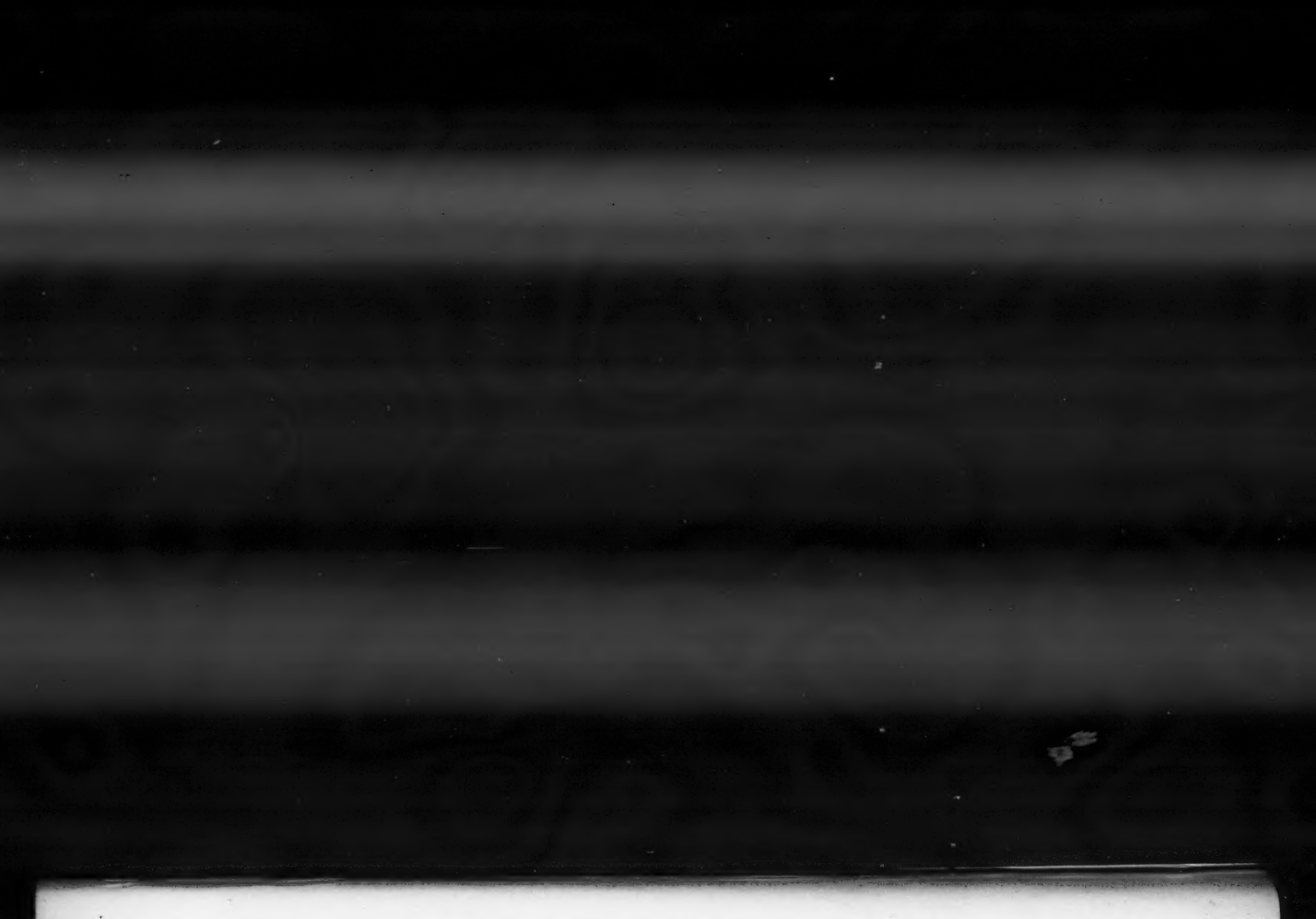

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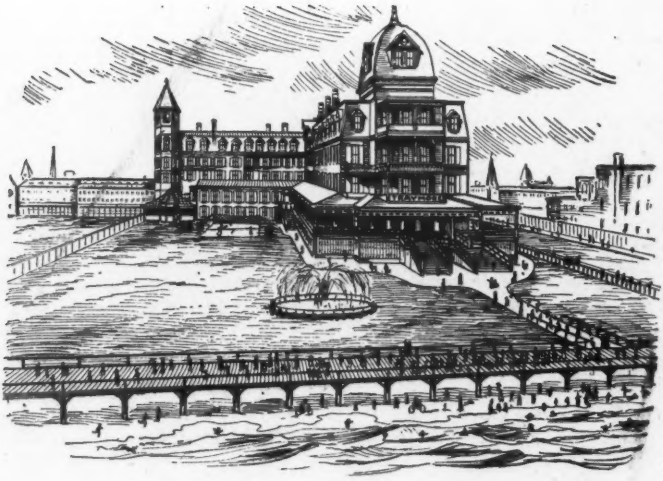

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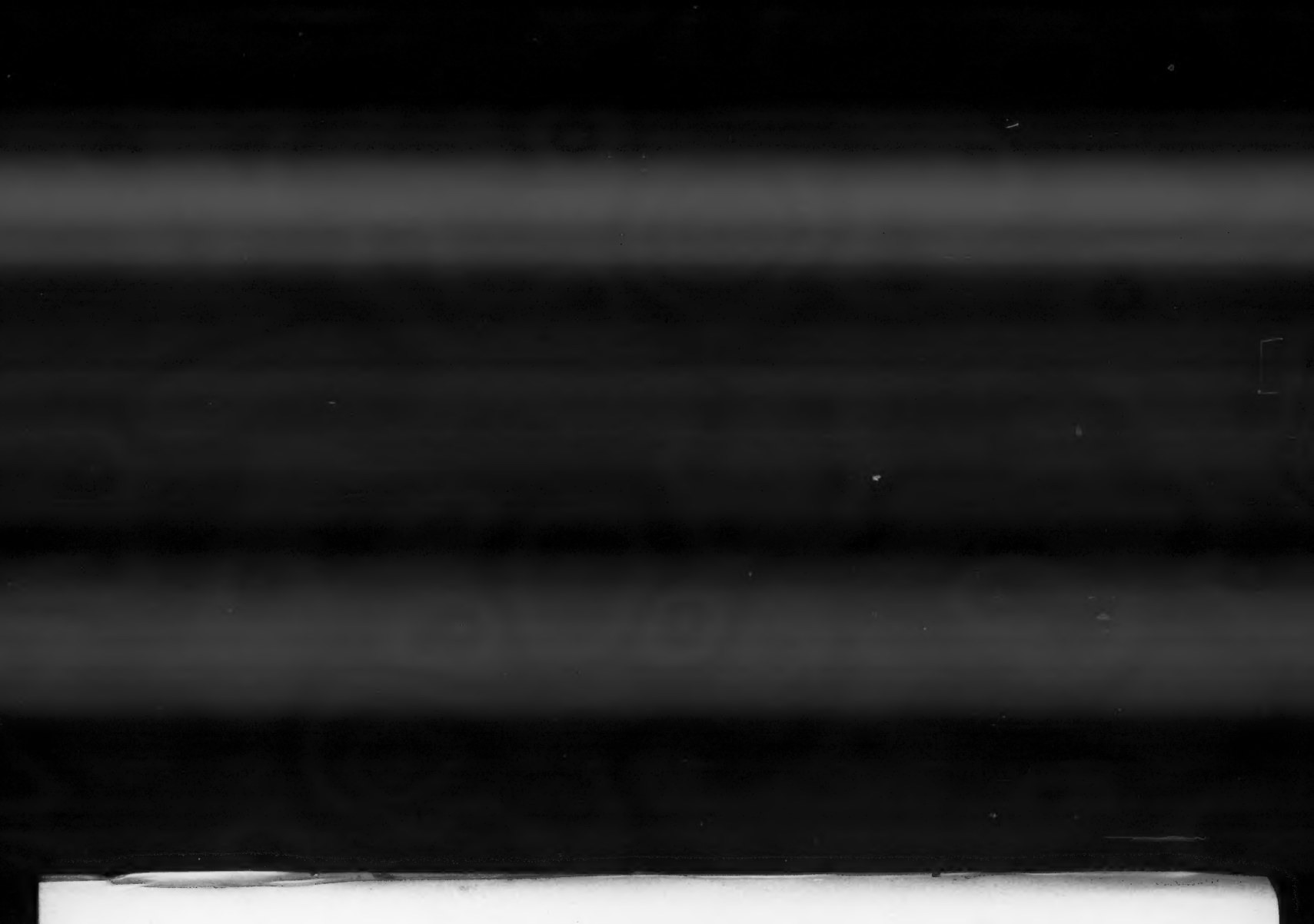
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